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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,882	12/03/2003	James Mac Freitag	HSJ920030208US1	6759

7590 06/28/2006

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EXAMINER

RENNER, CRAIG A

ART UNIT PAPER NUMBER

2627

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/727,882

Applicant(s)

FREITAG ET AL.

Examiner

Craig A. Renner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 5-9, 11-15 and 19-23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>03 December 2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include one or more reference signs not mentioned in the description. Note, for instance, "P1" shown in FIGS. 6, 7 and 10, for instance), "P2" (shown in FIGS. 6 and 7, for instance), "S2" (shown in FIGS. 6, 7, 9 and 10, for instance), "S1" (shown in FIGS. 7, 9 and 10, for instance), "132" (shown in FIG. 9, for instance), "252" (shown in FIG. 10, for instance), and "254" (shown in FIG. 10, for instance).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) and/or an amendment to the specification in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:
 - a. In line 1 of the abstract, --head-- should be inserted after "read" for better clarity.
 - b. In line 8 of claim 1, "the free layer" should be changed to --the free layer structure-- in order to more clearly refer back to that set forth in line 6 of claim 1.
 - c. In line 1 of claim 4, "the free layer" should be changed to --the free layer structure-- in order to more clearly refer back to that set forth in line 6 of independent claim 1.
 - d. In lines 6 and 8-9 of claim 16 and line 2 of claim 8, each instance of "free layer" should be changed to --free layer structure-- for consistency and in order to provide a better antecedent for that referenced in line 2 of claim 22.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 4 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 2 of claim 4 and lines 2-3 of claim 18, each instance of "the first pole piece layer" is indefinite because it lacks clear and/or positive antecedent basis.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 10, 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawato et al. (US 6,327,123).

With respect to claims 1-4, Kawato teaches a magnetic head assembly that has a head surface, comprising a read head (15/FIG. 6, for instance) that includes a sensor (108); the sensor including an antiparallel pinned layer structure (105); a ferromagnetic free layer structure (21) having a magnetic moment that is free to rotate in response to a field signal; and a spacer layer (104) located between the free layer structure and the antiparallel pinned layer structure (as shown in FIG. 6, for instance); the antiparallel pinned layer structure including ferromagnetic first (24) and second (22) antiparallel pinned layers; an antiparallel coupling layer (23) located between and interfacing the first and second antiparallel pinned layers (as shown in FIG. 6, for instance); the first and second antiparallel pinned layers self pinning one another without assistance of an antiferromagnetic pinning layer (as shown in FIG. 6, for instance); the second

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antiparallel pinned layer being located between the first antiparallel pinned layer and the spacer layer (as shown in FIG. 6, for instance); and the first antiparallel pinned layer being composed of cobalt platinum chromium (lines 49-50 in column 4, for instance) [as per claim 1]; wherein the magnetic head assembly further includes nonmagnetic electrically nonconductive first (103) and second (401) read gap layers; the sensor being located between the first and second read gap layers (as shown in FIG. 6 taken in conjunction with FIG. 4, for instance); ferromagnetic first (102) and second (402) shield layers; and the first and second read gap layers being located between the first and second shield layers (as shown in FIG. 4, for instance) [as per claim 2]; wherein the magnetic head assembly further comprises a write head (403) including ferromagnetic first and second pole piece layers that have a yoke portion located between a pole tip portion and a back gap portion (as shown in FIG. 4, for instance); a nonmagnetic write gap layer located between the pole tip portions of the first and second pole piece layers (as shown in FIG. 4, for instance); an insulation stack with at least one coil layer embedded therein located between the yoke portions of the first and second pole piece layers (as shown in FIG. 4, for instance); and the first and second pole piece layers being connected at their back gap portions (as shown in FIG. 4, for instance) [as per claim 3]; and wherein the free layer structure is located between the antiparallel pinned layer structure and the first pole piece layer (as shown in FIG. 6 taken in conjunction with FIG. 4, for instance) [as per claim 4].

With respect to claim 10, Kawato teaches a magnetic disk drive including at least one magnetic head assembly (16) that has a head surface and that includes a write

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head (403) and a read head (15/FIG. 6, for instance), comprising the write head including ferromagnetic first and second pole piece layers that have a yoke portion located between a pole tip portion and a back gap portion (as shown in FIG. 4, for instance); a nonmagnetic write gap layer located between the pole tip portions of the first and second pole piece layers (as shown in FIG. 4, for instance); an insulation stack with at least one coil layer embedded therein located between the yoke portions of the first and second pole piece layers (as shown in FIG. 4, for instance); and the first and second pole piece layers being connected at their back gap portions (as shown in FIG. 4, for instance); the read head including nonmagnetic electrically nonconductive first (103) and second (401) read gap layers; a sensor (108) located between the first and second read gap layers (as shown in FIG. 6 taken in conjunction with FIG. 4, for instance); ferromagnetic first (102) and second (402) shield layers; and the first and second read gap layers being located between the first and second shield layers (as shown in FIG. 4, for instance); the sensor including an antiparallel pinned layer structure (105); a ferromagnetic free layer structure (21) having a magnetic moment that is free to rotate in response to a field signal; and a spacer layer (104) located between the free layer structure and the antiparallel pinned layer structure (as shown in FIG. 6, for instance); the antiparallel pinned layer structure including ferromagnetic first (24) and second (22) antiparallel pinned layers; an antiparallel coupling layer (23) located between and interfacing the first and second antiparallel pinned layers (as shown in FIG. 6, for instance); the first and second antiparallel pinned layers self pinning one another without assistance of an antiferromagnetic pinning layer (as shown in FIG. 6, for

instance); the second antiparallel pinned layer being located between the first antiparallel pinned layer and the spacer layer (as shown in FIG. 6, for instance); and the first antiparallel pinned layer being composed of cobalt platinum chromium (lines 49-50 in column 4, for instance); a housing (as shown in FIG. 5, for instance, i.e., the components of the magnetic storage and retrieval apparatus shown in FIG. 5 would inherently be provided in a housing); a magnetic medium (201) being supported in the housing; a support (502) mounted in the housing for supporting the magnetic head assembly with the head surface facing the magnetic medium so that the magnetic head assembly is in a transducing relationship with the magnetic medium (as shown in FIG. 5, for instance); a motor (31) for moving the magnetic medium; and a processor (33) connected to the magnetic head assembly and to the motor for exchanging signals with the magnetic head assembly and for controlling movement of the magnetic medium (as shown in FIG. 5, for instance).

With respect to claims 16-18, Kawato teaches a method of making a magnetic head assembly, which has a head surface, comprising the steps of forming a read head (15/FIG. 6, for instance) that includes a sensor (108); a making of the sensor including the steps of forming an antiparallel pinned layer structure (105); forming a ferromagnetic free layer structure (21) that has a magnetic moment that is free to rotate in response to a field signal; and forming a nonmagnetic electrically conductive spacer layer (104) between the free layer structure and the antiparallel pinned layer structure (as shown in FIG. 6, for instance); the forming of the antiparallel pinned layer structure including the steps of forming ferromagnetic first (24) and second (22) antiparallel pinned layers;

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forming an antiparallel coupling layer (23) between and interfacing the first and second antiparallel pinned layers (as shown in FIG. 6, for instance); the first and second antiparallel pinned layers being further formed to self pin one another without assistance of an antiferromagnetic pinning layer (as shown in FIG. 6, for instance); forming the second antiparallel pinned layer between the first antiparallel pinned layer and the spacer layer (as shown in FIG. 6, for instance); and forming the first antiparallel pinned layer of cobalt platinum chromium (lines 49-50 in column 4, for instance) [as per claim 16]; wherein the method further comprises the steps of forming nonmagnetic electrically nonconductive first (103) and second (401) read gap layers; forming the sensor between the first and second read gap layers (as shown in FIG. 4, for instance); forming ferromagnetic first (102) and second (402) shield layers; and forming the first and second read gap layers between the first and second shield layers (as shown in FIG. 4, for instance) [as per claim 17]; and wherein the free layer structure is formed between the antiparallel pinned layer structure and the first pole piece layer (as shown in FIG. 6 taken in conjunction with FIG. 4, for instance) [as per claim 18].

Claim Rejections/Considerations - 35 USC § 103

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Pertinent Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Gill (US 2004/0008450), which teaches a self-pinned spin valve sensor with a high coercivity antiparallel (AP) pinned layer made of cobalt platinum ($\text{Co}_{75}\text{Pt}_{25}$).

Allowable Subject Matter

9. Claims 5-9, 11-15 and 19-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (571) 272-7580. The examiner can normally be reached on Tuesday-Friday 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Craig A. Renner
Primary Examiner
Art Unit 2627

CAR